



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,251	07/22/2003	Kwanyoung Lee	61282.00005	7328
30256	7590	09/22/2004	EXAMINER	
SQUIRE, SANDERS & DEMPSEY L.L.P			ASINOVSKY, OLGA	
600 HANSEN WAY			ART UNIT	
PALO ALTO, CA 94304-1043			PAPER NUMBER	

1711

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/624,251

Applicant(s)

LEE ET AL.

Examiner

Olga Asinovsky

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 05/17/04; 12/10/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

The preliminary amendment is noted

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delme et al U.S. Patent 6,576,686 in view of Tung et al U.S. Patent 4,631,314.

The claimed invention is a ternary block copolymer with penta-block structure having the structure of pS-pl-pB-pl-pS.

Delme discloses a linear block copolymer comprising polystyrene, polyisoprene and polybutadiene components, column 2, lines 13-15. The S-block is present in the amount of about 10 parts to 90 parts of the block copolymer, column 1, line 63. A block copolymer is produced by anionic polymerization technique in the presence of an organolithium initiator with a cyclohexane solvent. The process includes steps of sequentially charging the initiator and desired additional monomer, column 4, lines 7-20. The styrene content in the resulting block copolymer is from 10 to 30 wt.%, column 8, line 5. Delme discloses a linear tetrablock copolymer.

The difference between the present claims and Delme is that Delme does not disclose a block copolymer having penta-block structure of formula (1) in the present claims.

Art Unit: 1711

Tung discloses a multiblock copolymer including a pentablock copolymer having ABCBA configuration, wherein A is polystyrene block, B is polybutadiene block, and C is a poly(1,3-pentadiene) block. The polymerization is carried out in the presence of organolithium initiator in cyclohexane solvent.

It would have been obvious to one of ordinary skill in the art to modify a process of producing a block copolymer in Delme's invention as disclosed by Tung for making a penta-block copolymer because Delme discloses a sequentially adding initiator and desired monomer of butadiene or isoprene such that the linear block copolymer can have at least five block units and the end of the penta-block copolymer can have a polystyrene block. The prima facie case of obviousness is that a method of producing a tetrablock copolymer in Delme invention can be modified for making a penta-block copolymer as suggested by Tung.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 6-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Diehl et al U.S. Patent 5,399,627.

Independent claim 6 discloses a method for making a triblock living polymer and a reaction with a coupling agent.

Art Unit: 1711

Diehl discloses a radial styrene-isoprene-butadiene-multi-armed block copolymer represented by the formula at column 2, line 50. The block copolymer is produced by sequentially adding an organolithium initiator with a solvent such as cyclohexane, column 3, lines 53-68 and column 4, lines 43-66. In a first step styrene monomer is polymerizing by an anionic polymerization for making a living polystyrene polymer. In the next step an isoprene monomer is added to the resulting product from first step. Then, adding butadiene monomer to the product from the second step for producing a triblock copolymer. And, then, coupling the pS-pl-pB-Li product with a multifunctional coupling agent such as SiCl<sub>4</sub>. The method of producing a block copolymer in Diehl'627 is equivalent to the present claims. The coupling agent is readable in the present claim 10. The coupling efficiency of the block copolymer is about 70% to about 95%, column 15, line 38. The applicants' claimed method for making a block copolymer comprising polystyrene-polyisoprene-polybutadiene block copolymer lack novelty.

### ***Claim Rejections - 35 USC § 112***

5. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase: "The ternary block copolymer with penta-block structure" having the formula (1) pS-pl-pB-pl-pS is confusing because a penta-block copolymer has five blocks. The term "ternary" is consisting of three. Therefore, it is not clear the structure of a block copolymer.

Art Unit: 1711

The article "The" should be substituted with -A- in claim 1.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art is relevant to show the state of the art knowledge.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Olga Asinovsky whose telephone number is 571-272-1066. The examiner can normally be reached on 9:00 to 5:30 pm.

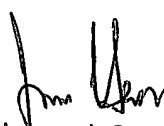
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

O.A.

O.A.  
September 19, 2004

Olga Asinovsky  
Examiner  
Art Unit 1711

  
James J. Seidleck  
Supervisory Patent Examiner  
Technology Center 1700